



FTW

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.: 10/523,167 Confirmation No.:
8220
Applicant(s): Borran et al.
Filed: 03/10/2006
Art Unit: 2617
Examiner:
Title: Method and Apparatus to Establish Constellations for
Imperfect Channel State Information at a
Receiver

Attorney Docket No.: 873.0115.U1(US)
Customer No.: 29,683

Commissioner For Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Request For Corrected Filing Receipt

Sir:

This is in response to the Corrected Filing Receipt (copy enclosed) received in regard to the above-identified patent application. The Filing Receipt contains an error.

Please correct the applicant information. The correct spelling of the third listed inventor's name is:

Behnaam Aazhang.

Also enclosed is a copy of the Declaration and the first page of International Publication WO 2004/004172.

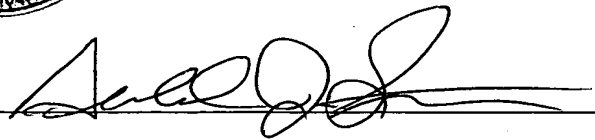
Please send the undersigned a corrected Filing Receipt.

Thank you.



ESSN 10/523,167

Respectfully submitted,



 Sep 8, 2006

Gerald J. Stanton (Reg. No. 46,008)

Date

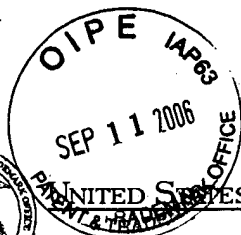
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CERTIFICATE OF MAILING

I hereby certify that this correspondence is being deposited with the United States Postal Service as first class mail on the date shown below in an envelope addressed to: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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APPL NO.	FILING OR 371 (c) DATE	ART UNIT	FIL FEE REC'D	ATTY. DOCKET NO	DRAWINGS	TOT CLMS	IND CLMS
10/523,167	03/10/2006	2611	1780	873.0115.U1(US)	9	25	7

CONFIRMATION NO. 8220

CORRECTED FILING RECEIPT



OC000000020289776

29683
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Date Mailed: 09/01/2006

Receipt is acknowledged of this regular Patent Application. It will be considered in its order and you will be notified as to the results of the examination. Be sure to provide the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION when inquiring about this application. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please mail to the Commissioner for Patents P.O. Box 1450 Alexandria Va 22313-1450. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections (if appropriate).**

Applicant(s)

Mohammad Jaber Borran, San Diego, CA;
Ashutosh Sabharwal, Houston, TX;
Bahnaam Aazhang, Houston, TX;

Power of Attorney: The patent practitioners associated with Customer Number 29683.

Domestic Priority data as claimed by applicant

This application is a 371 of PCT/IB03/02088 05/29/2003
which claims benefit of 60/393,083 07/01/2002

Foreign Applications

If Required, Foreign Filing License Granted: 09/01/2006

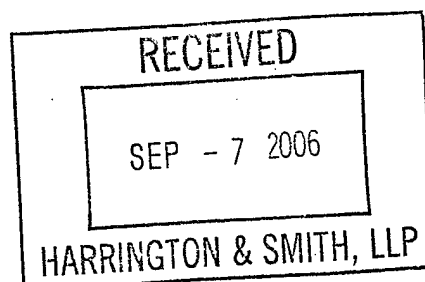
The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US10/523,167**

Projected Publication Date: 09/14/2006

Non-Publication Request: No

Early Publication Request: No

Title



Method and apparatus to establish constellations for imperfect channel state information at a receiver

Preliminary Class

375

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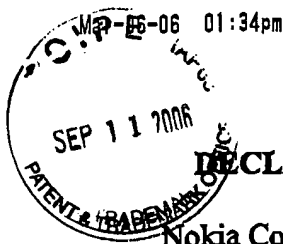
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**DECLARATION AND POWER OF ATTORNEY FOR PATENT APPLICATION**

Nokia Corporation Docket No.: NC17629US

Harrington & Smith, LLP Docket No.: 873.0115.U1(US)

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name.

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled:

**Method and Apparatus to Establish Constellations for Imperfect
Channel State Information at a Receiver**

the specification of which

(check one) _____ is attached hereto.

 X was filed on 29 May 2003 as Application Serial No. PCT/IB2003/002088

_____ and/or that was amended on .

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims, as amended by any amendment referred to above.

I acknowledge the duty to disclose to the U.S. Patent and Trademark Office all information known to me to be material to the patentability of this application as defined in Title 37, Code of Federal Regulations, §1.56.

I hereby claim foreign priority benefits under Title 35, United States Code, 119 of any foreign application(s) for patent or inventor's certificate(s) listed below and have also identified below any foreign application(s) for patent or inventor's certificate(s) having a filing date before that of the application on which priority is claimed:

Prior Foreign Application(s)

Priority Claimed

(Number)

(Country)

(Day/Mon/Year Filed)

_____ Yes _____ No

I hereby claim the benefit under Title 35, United States Code, §119(e) of the United States provisional patent application(s) listed below:

60/383,083

(Application Serial No.)

July 1, 2002

(Filing Date)

I hereby claim benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

(Application Serial No.)(Filing Date)

(Status)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the attorneys and/or agents listed below to prosecute this application and transact all business in the Patent and Trademark Office connected therewith.

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I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

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(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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60/393,083 1 July 2002 (01.07.2002) US

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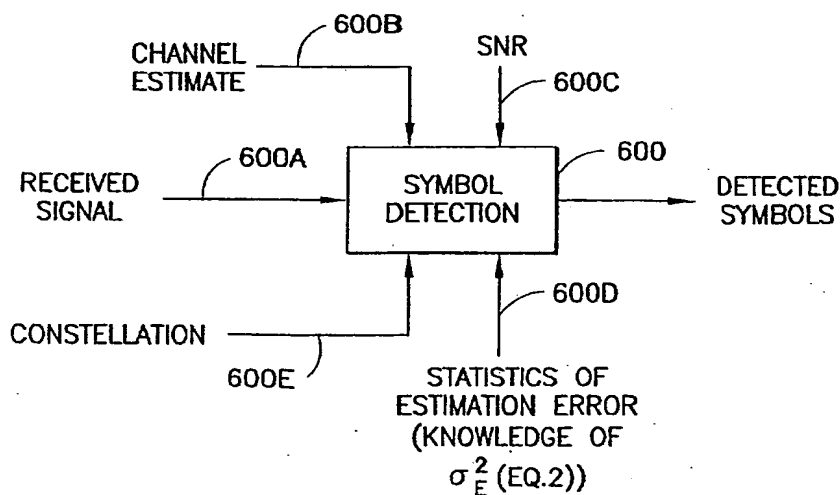
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(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

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[Continued on next page]

(54) Title: METHOD AND APPARATUS TO ESTABLISH CONSTELLATIONS FOR IMPERFECT CHANNEL STATE INFORMATION AT A RECEIVER



(57) Abstract: The system and method utilize design criteria and construction for signal constellations in communication systems, such as cellular telephony, that have imperfect channel state information at the receiver. The system and method assume an imperfect knowledge of fading channel state information (600B) and statistics of channel fading (600D) are used to encode additional information into the space-time matrix signal constellation as variations in amplitude of constellation (600E) points. In the preferred embodiment space-time matrix constellations and design criterion are based on the Kullback-Leibler distance between conditional distributions.

WO 2004/004172 A1